Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for converting chemical energy into a useful form, comprising:

using reactants and catalyst to create highly vibrationally excited molecules ~~species~~, the highly vibrationally excited molecules being created in a catalytic reaction where at least some of products of the catalytic reaction desorb and leave a surface of the catalytic reaction;

coupling the highly vibrationally excited molecules ~~species~~ with electrons by placing the highly vibrationally excited molecules ~~species~~ near a conducting surface for electron-jump effect to occur;

causing at least some of kinetic energy of the highly vibrationally excited molecules to transfer to the electrons of the conducting surface, resulting in excited carriers being created;

~~creating excited carriers from the coupling of the excited species;~~

collecting the excited carriers; and

converting ~~an~~ energy of the excited carriers into ~~a useful form of~~ electrical energy.

2. (previously presented) The method of claim 1, wherein the collecting includes collecting the excited carriers using a semiconductor.

3. (previously presented) The method of claim 1, wherein the converting includes converting the excited carriers into chemical potential across a diode junction.

4. (currently amended) ~~The method of claim 1, wherein the converting excited carriers includes energizing with the excited carriers to energize a semiconductor device to emit electromagnetic radiation.~~ A method for converting chemical energy into a useful form, comprising:

using reactants and catalyst to create highly vibrationally excited molecules, the highly vibrationally excited molecules being created in a catalytic reaction where at least some of products of the catalytic reaction desorb and leave a surface of the catalytic reaction;

coupling the highly vibrationally excited molecules with electrons by placing the highly vibrationally excited molecules near a conducting surface for electron-jump effect to occur;

causing at least some of kinetic energy of the highly vibrationally excited molecules to transfer to the electrons of the conducting surface, resulting in excited carriers being created;

collecting the excited carriers; and

converting energy of the excited carriers by energizing with the excited carriers to energize a semiconductor device to emit electromagnetic radiation.

5. (previously presented) The method of claim 4, wherein the semiconductor device is a light emitting diode.

6. (previously presented) The method of claim 4, wherein the semiconductor device is a quantum well structure.

7. (previously presented) The method of claim 1, wherein the using reactants includes reacting fuel with oxidizer.

8. (previously presented) The method of claim 1, wherein the using reactants includes allowing reactants to enter and exhaust products to leave a vicinity of the conducting surface where reactions that create the highly vibrationally excited molecules ~~species~~ occur.

9-26. (canceled)

27. (currently amended) The method of claim 4 ~~1~~, wherein the converting includes converting flux of the excited carriers into an inverted population of carriers in a semiconductor.

28. (previously presented) The method of claim 27, further including:

extracting energy stored in the inverted population of carriers as electromagnetic radiation.

29. (previously presented) The method of claim 28, wherein the method further includes causing stimulated emission to extract the electromagnetic radiation.

30. (previously presented) The method of claim 1, wherein the collecting includes collecting the excited carriers using a semiconductor diode.

31. (previously presented) The method of claim 1, wherein the collecting includes collecting the excited carriers using a Schottky junction diode.

32. (previously presented) The method of claim 1, wherein the collecting includes collecting the excited carriers using a bipolar semiconductor.

33. (previously presented) The method of claim 1, wherein the collecting includes collecting the excited carriers using an n-type semiconductor.

34. (previously presented) The method of claim 1, wherein the collecting includes collecting the excited carriers using a p-type semiconductor diode.

35. (previously presented) The method of claim 1, wherein the collecting includes collecting the excited carriers using a p-n junction diode.

36. (previously presented) The method of claim 1, further including placing a first electrode in contact with the conducting surface.

37. (currently amended) A method for generating a useful form of energy, comprising:

using one or more reactants on one or more catalyst surfaces to create highly vibrationally excited molecules ~~species~~, the highly vibrationally excited molecules being created

in a catalytic reaction where at least some of products of the catalytic reaction desorb and leave a surface of the catalytic reaction;

coupling the highly vibrationally excited molecules ~~species~~ with electrons by placing the highly vibrationally excited molecules ~~species~~ near a conducting surface for electron-jump effect to occur;

causing at least some of kinetic energy of the highly vibrationally excited molecules to transfer to the electrons of the conducting surface, resulting in excited carriers being created;

~~creating excited carriers from the coupling of the excited species;~~

collecting the excited carriers; and

converting an energy of the excited carriers into electricity ~~a useful form of energy~~.

38-41. (canceled)

42. (previously presented) The method of claim 1, wherein the reactants include a fuel.

43. (previously presented) The method of claim 37, wherein the reactants include a fuel.

44. (previously presented) The method of claim 1, wherein the reactants include an oxidizer.

45. (previously presented) The method of claim 37, wherein the reactants include an oxidizer.

46. (previously presented) The method of claim 37, wherein the one or more catalyst surfaces include one or more step formations.

47. (new) The method of claim 37, wherein the reactants include at least H_2O_2 and the one or more catalyst surfaces include at least Ag.

48. (new) The method of claim 1, wherein the reactants include at least H_2O_2 and the one or more catalyst surfaces include at least Ag.

49. (new) A method for an electric generator that converts chemical energy into electricity, comprising:

using reactants and catalyst to create highly vibrationally excited molecules, the highly vibrationally excited molecules being created in a catalytic reaction where at least some of products of the catalytic reaction desorb and leave a surface of the catalytic reaction;

coupling the highly vibrationally excited molecules with electrons by placing the highly vibrationally excited molecules near a conducting surface for electron-jump effect to occur;

causing at least some of kinetic energy of the highly vibrationally excited molecules to transfer to the electrons of the conducting surface, resulting in excited carriers being created;

collecting the excited carriers; and

converting energy of the excited carriers into electrical energy with efficiency greater than 2% of catalytic reaction energy.